

What is Claimed Is:

1. An apparatus comprising:
 - (a) a chamber defining an interior space adapted to be maintained at a reduced pressure; and
 - (b) a gas supply means for supplying at least one burst of gas to said chamber for rapidly establishing at least one preselected gas pressure in said chamber, said gas supply means including:
 - (i) a source of said gas;
 - (ii) a supply ballast fluidly connected to said gas source for receiving said gas from said source;
 - 10 (iii) at least one burst ballast fluidly connected to said supply ballast *via* a metering valve for receiving said gas from said supply ballast; and
 - (iv) an on/off valve fluidly connected to said at least one burst ballast and said chamber for supplying said process chamber with said gas from said at least one burst ballast.
- 15 2. The apparatus as in claim 1, wherein:
said chamber includes means for mounting at least one substrate/workpiece in said interior space.
3. The apparatus as in claim 2, wherein:
said means for mounting at least one substrate/workpiece in said interior space comprises means for mounting at least one disk-shaped substrate for a magnetic or magneto-optical (MO) recording medium.
4. The apparatus as in claim 2, wherein:
said chamber is a process chamber and includes means for performing at least one process treatment on said at least one substrate/workpiece.

5. The apparatus as in claim 4, wherein:
said chamber includes means for performing at least one thin film deposition process on said at least one substrate/workpiece.
6. The apparatus as in claim 5, wherein:
said chamber includes means for performing at least one sputter deposition process on said at least one substrate/workpiece.
7. The apparatus as in claim 6, wherein:
said chamber includes means for performing at least one reactive sputter deposition process on said at least one substrate/workpiece, and said gas supply means supplies at least one reactive gas to said chamber.
8. The apparatus as in claim 1, wherein:
said gas supply means is adapted for sequentially supplying a plurality of different bursts of gas to said chamber for rapidly establishing a respective plurality of preselected gas pressures in said chamber, said gas supply means
5 including a plurality of burst ballasts fluidly connected to said supply ballast *via* respective metering valves, and a corresponding plurality of on/off valves fluidly connected to respective ones of said plurality of burst ballasts and said chamber for supplying said process chamber with said gas from a selected one of said plurality of burst ballasts.
9. The apparatus as in claim 1, wherein:
said gas supply means is adapted for sequentially supplying first and second bursts of gas to said chamber for rapidly establishing respective first and second preselected gas pressures in said chamber, said gas supply means
5 comprising first and second burst ballasts fluidly connected to said supply ballast *via* respective first and second metering valves, and first and second on/off valves respectively fluidly connected to said first and second burst ballasts and said

chamber for supplying said process chamber with said gas from a selected one of said first and second burst ballasts.

10. The apparatus as in claim 1, further comprising:

(c) means for controlling operation of said on/off valve.

11. The apparatus as in claim 10, wherein:

said means for controlling operation of said on/off valve comprises computer control means.

12. A method, including steps for rapidly establishing at least one preselected gas pressure in a reduced pressure chamber, comprising steps of:

(a) providing an apparatus comprising:

5 (i) a chamber defining an interior space adapted to be maintained at a reduced pressure; and

(ii) a gas supply means for supplying at least one burst of gas to said chamber for rapidly establishing at least one preselected gas pressure in said chamber, said gas supply means including:

10 (1) a source of said gas;
(2) a supply ballast fluidly connected to said gas source for receiving said gas from said source;

(3) at least one burst ballast fluidly connected to said supply ballast *via* a metering valve for receiving said gas from said supply ballast; and

15 (4) an on/off valve fluidly connected to said at least one burst ballast and said chamber for supplying said process chamber with said gas from said at least one burst ballast.

(b) providing said supply ballast with said gas from said source;

20 (c) providing said at least one burst ballast with said gas from said supply ballast;

(d) providing said chamber with a burst of said gas from said at least one burst ballast to establish said at least one preselected gas pressure in said chamber; and

25 (e) providing a steady flow of said gas from said at least one burst ballast to said chamber to maintain said at least one preselected gas pressure therein.

13. The method according to claim 12, wherein:

step (a) comprises providing a process chamber including means for mounting at least one substrate/workpiece in said interior space and means for performing at least one process treatment on said at least one substrate/workpiece;

5 step (c) comprises equilibrating the gas pressure in said at least one burst ballast with the gas pressure in said supply ballast, while maintaining said on/off valve in a closed, off position, and setting the pressure x volume (PV) product of said gas in said burst ballast at a level sufficient to rapidly establish said at least one preselected gas pressure in said chamber in step (d);

10 step (d) comprises maintaining said on/off valve in an open, on position; and

step (e) comprises utilizing said metering valve to provide said steady flow of said gas from said at least one burst ballast to said chamber to maintain said at least one preselected gas pressure therein.

14. The method according to claim 13, wherein:

step (a) comprises providing a process chamber including means for mounting at least one substrate/workpiece in said interior space.

15. The method according to claim 14, wherein:

step (a) comprises providing a process chamber including means for mounting at least one disk-shaped substrate/workpiece for a magnetic or magneto-optical recording medium in said interior space.

16. The method according to claim 14, wherein:

step (a) comprises providing a process chamber including means for performing at least one thin film deposition process on said at least one substrate/workpiece.

17. The method according to claim 16, wherein:

step (a) comprises providing a process chamber including means for performing at least one sputter deposition process on said at least one substrate/workpiece.

18. The method according to claim 17, wherein:

step (a) comprises providing a process chamber including means for performing at least one reactive sputter deposition process on said at least one substrate/workpiece, and a source of gas including at least one reactive gas.

19. The method according to claim 13, wherein:

step (a) comprises providing a gas supply means adapted for sequentially supplying a plurality of different bursts of gas to said chamber for rapidly establishing a respective plurality of preselected gas pressures in said chamber,
5 said gas supply means including a plurality of burst ballasts fluidly connected to said supply ballast *via* respective metering valves, and a corresponding plurality of on/off valves fluidly connected to respective ones of said plurality of burst ballasts and said chamber for supplying said process chamber with said gas from a selected one of said plurality of burst ballasts.

20. The method according to claim 13, wherein:

step (a) comprises providing a gas supply means adapted for sequentially supplying first and second bursts of gas to said chamber for rapidly establishing respective first and second preselected gas pressures in said chamber, said gas
5 supply means comprising first and second burst ballasts fluidly connected to said

supply ballast *via* respective first and second metering valves, and first and second on/off valves respectively fluidly connected to said first and second burst ballasts and said chamber for supplying said process chamber with said gas from a selected one of said first and second burst ballasts.